A group of 10 college students was given a short course in speed-reading. The instructor was curious if a monetary incentive would influence performance on a reading test taken at the end of the course.  She believed that students would do better on a test if they were paid. Five of the students were offered $5 for obtaining an A on the test, the other five were not offered money.  The professor then averaged the scores on the test for each group.

1. What is the independent variable?
2. What is dependent variable?
3. What are 2 things the professor should keep constant?

Rebecca believed that older students could put jigsaw puzzles together faster than younger students. She decided to test it. One 1 five year old and 1 eight year old were given the same jigsaw puzzle to put together. They were timed to see how long it took each one to finish the puzzle.

1. What is the problem?
2. What is the hypothesis?
3. What is wrong with the way that Rebecca designed her experiment?

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1. What is the independent variable?
2. What is the dependent variable?
3. What are 2 things that Rebecca should try to keep constant?

An investigation was done to determine how the size of nails would affect the strength of an electromagnetic system made from a battery and wire wrapped around a nail. Based on what he learned in physical science, Brad expected to be able to pick up more paper clips if he used larger nails. He made 2 electromagnetic systems for each nail size: half inch and inch. He used the same type of wire in each system. The half inch nails picked up an average of 10 paperclips and the inch nails picked up an average of 11 paperclips.

1. What is the problem?
2. What is the hypothesis?
3. Do the data support Brad’s hypothesis? Why or why not?

An investigation was done to determine how the size of nails would affect the strength of an electromagnetic system made from a battery and wire wrapped around a nail. Based on what he learned in physical science, Brad expected to be able to pick up more paper clips if he used larger nails. He made 2 electromagnetic systems for each nail size: half inch and inch. He used the same type of wire in each system. The half inch nails picked up an average of 10 paperclips and the inch nails picked up an average of 11 paperclips.

1. What is the independent variable?
2. What is the dependent variable?
3. What are 2 things that Brad should keep constant?

Dudley was tired of waiting so long for his eggs to boil. He wondered whether the temperature of the water would affect the rate of boiling. He believed that the higher the temperature of water, the faster an egg will boil. He boiled 12 large eggs at 100°C and 12 large eggs at 120°C. The eggs boiled at 100°C took 18 minutes and the eggs boiled at 120°C took 9 minutes.

1. What is the problem?
2. What is the hypothesis?
3. Do the data support Dudley’s hypothesis? Why or why not?

Dudley was tired of waiting so long for his eggs to boil. He wondered whether the temperature of the water would affect the rate of boiling. He believed that the higher the temperature of water, the faster an egg will boil. He boiled 12 large eggs at 100°C and 12 large eggs at 120°C. The eggs boiled at 100°C took 18 minutes and the eggs boiled at 120°C took 9 minutes.

1. What is the independent variable?
2. What is the dependent variable?
3. What are 2 things that Dudley should keep constant?

Shaq wanted to win a contest for bouncing a ball the highest. He decided to test whether the height you drop a ball from affects the height of the bounce. Shaq thought the farther a ball drops, the higher it will bounce. He dropped a tennis ball once from 3 feet and once from 12 feet and recorded the height of the bounce. The one dropped from 3 feet bounced 2 feet high and the one dropped from 12 feet bounced 6 feet high.

1. What is the problem?
2. What is the hypothesis?
3. Can Shaq conclude that his hypothesis was correct based on just this experiment? Why or why not?

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1. What is the independent variable?
2. What is the dependent variable?
3. What are 2 things that Shaq should keep constant?

The Johnson family has decided to try to save electricity (and money at the same time) and wondered if changing light bulbs would help.  Their research led them to believe that replacing their regular light bulbs with special fluorescent bulbs would use less energy.  To test it, they plug 4 lamps into a special outlet that measures energy used. Two lamps use regular light bulbs and two use the fluorescent bulbs. After 20 hours of use, they record the total energy used per light bulb. The regular bulbs used an average of 60 watt hours and the fluorescent bulbs used an average of 13 watt hours.

1. What is the problem?
2. What is the hypothesis?
3. Was the Johnson’s hypothesis supported? Why or why not?

The Johnson family has decided to try to save electricity (and money at the same time) and wondered if changing light bulbs would help.  Their research led them to believe that replacing their regular light bulbs with special fluorescent bulbs would use less energy.  To test it, they plug 4 lamps into a special outlet that measures energy used. Two lamps use regular light bulbs and two use the fluorescent bulbs. After 20 hours of use, they record the total energy used per light bulb. The regular bulbs used an average of 60 watt hours and the fluorescent bulbs used an average of 13 watt hours.

1. What is the independent variable?
2. What is the dependent variable?
3. What are 2 things that the Johnson family should keep constant?

Jack wanted to test which brand of car wax was most effective at beading up the water. He tested four brands of wax. He thought that Turtle Wax would have the largest beads of water. He measured 5 equal sections on the hood of the car. Each of the waxes was used to cover a section, and one section was left without wax. An equal amount of wax, the same type of rag, and equal buffing were used. Five drops of water were placed on each square, and the diameter of each drop was measured in centimeters.

1. What is the problem?
2. What is the hypothesis?
3. What was Jack’s control?

Jack wanted to test which brand of car wax was most effective at beading up the water. He tested four brands of wax. He thought that Turtle Wax would have the largest beads of water. He measured 5 equal sections on the hood of the car. Each of the waxes was used to cover a section, and one section was left without wax. An equal amount of wax, the same type of rag, and equal buffing were used. Five drops of water were placed on each square, and the diameter of each drop was measured in centimeters.

1. What is the independent variable?
2. What is the dependent variable?
3. What are 2 things that Jack kept constant?

|  |  |  |
| --- | --- | --- |
| Trial | Women’s Time | Men’s Time |
| 1 | 5 min | 6 min |
| 2 | 4 min | 4 min |
| 3 | 6 min | 7 min |
| 4 | 5 min | 4 min |
| 5 | 4 min | 5 min |

Joanna read that women’s perfumes would agitate bees more than men’s perfumes. She decided to determine whether the type of perfume would affect the bee’s behavior. She placed a saucer containing 10 mL of the women’s perfume 3 m from the hive. She recorded the time required for the bees to emerge and made observations on their behavior. After a 30-minute recovery period, she tested the men’s perfumes. She repeated this procedure 5 times in a day.

1. What is the problem?
2. What is the hypothesis?
3. Was Joanna’s hypothesis supported? Why or why not?

Joanna read that women’s perfumes would agitate bees more than men’s perfumes. She decided to determine whether the type of perfume would affect the bee’s behavior. She placed a saucer containing 10 mL of the women’s perfume 3 m from the hive. She recorded the time required for the bees to emerge and made observations on their behavior. After a 30-minute recovery period, she put 10 mL the men’s perfumes 3 m from the hive. She repeated this procedure 5 times in a day.

1. What is the independent variable?
2. What is the dependent variable?
3. What are 2 things that Joanna kept constant?